

WE CLAIM:

1. A drilling flange for use with an independent screwed wellhead, comprising:
 - a flange body having a generally annular shape, the flange body including an axial passageway with an internal diameter at least as large as a passageway through the wellhead, and a bottom end adapted to be mounted to a top of the independent screwed wellhead, the bottom end of the flange body including an annular shoulder for rotatably supporting a lockdown nut for securing the flange body to the wellhead; and
 - a metal-to-metal seal for providing a fluid seal between the flange body and the wellhead.
2. A drilling flange as claimed in claim 1 further comprising an elastomeric seal for providing a further fluid seal between the flange body and the wellhead.
3. A drilling flange as claimed in claim 2 wherein the elastomeric seal is an O-ring.
4. A drilling flange as claimed in claim 1 wherein the metal-to-metal seal is a metal ring gasket.
5. A drilling flange as claimed in claim 1 wherein the metal-to-metal seal is provided by a first metal contact surface on a bottom end of the drill flange that cooperates with a second metal contact surface on the independent screwed wellhead, the first and

second metal contact surfaces being forced together by the lockdown nut to provide the metal-to-metal seal when the drilling flange is mounted to the independent screwed wellhead.

6. A drilling flange as claimed in claim 1 further comprising a wear bushing for guiding a drill string through the wellhead.
7. A drilling flange as claimed in claim 6 wherein the wear bushing is removably secured to a top of the axial passageway to facilitate replacement of the wear bushing.
8. A drilling flange as claimed in claim 7 wherein the wear bushing includes a peripheral groove in an outer surface thereof, and the wear bushing is removably secured to the flange body by a plurality of locking screws received in threaded radial bores through a top end of the flange body.
9. A drilling flange as claimed in claim 6 further comprising a top flange for mounting a blowout preventer to the independent screwed wellhead.
10. A drilling flange as claimed in claim 5 wherein the bottom end of the flange body comprises a hollow frusto-conical portion of converging radius in the downward axial direction, the frusto-conical portion being located between an upper abutment surface and a lower abutment surface, and the frusto-conical portion comprises a smooth metal contact surface for

forming the metal-to-metal seal with the second metal contact surface of the independent screwed wellhead.

11. A drilling assembly comprising:

an independent screwed wellhead secured to a well;

a drilling flange including a flange body having a generally annular shape, the flange body including an axial passageway with an internal diameter at least as large as a passageway through the wellhead, the flange body having a bottom end adapted to be mounted to a top of the independent screwed wellhead, a sidewall of the bottom end of the flange body including an annular shoulder for supporting a lockdown nut, the lockdown nut securing the flange body to the wellhead, and a metal-to-metal seal for providing a fluid seal between the flange body and the wellhead.

12. A drilling assembly as claimed in claim 11 further comprising an elastomeric seal for providing a further fluid seal between the flange body and the wellhead.

13. A drilling assembly as claimed in claim 12 wherein the independent screwed wellhead further comprises a lower abutment surface, an upper abutment surface, and a lateral contact surface between the lower abutment surface and the upper abutment surface, the drilling flange contacting the wellhead at the lower abutment surface, the upper abutment surface and the lateral contact surface.

14. A drilling assembly as claimed in claim 13 wherein the lateral contact surface is cylindrical.
15. A drilling assembly as claimed in claim 13 wherein the metal-to-metal seal is located along the lower abutment surface.
16. A drilling assembly as claimed in claim 13 wherein the metal-to-metal seal is located along the upper abutment surface.
17. A drilling assembly as claimed in claim 16 wherein the metal-to-metal seal comprises a metal ring gasket.
18. A drilling assembly as claimed in claim 13 wherein the radial contact surface is frusto-conical.
19. A method of drilling a well bore that communicates with at least one hydrocarbon formation comprising:
securing an independent screwed wellhead to a surface casing for the well bore;
attaching a drilling flange to the independent screwed wellhead such that a metal-to-metal seal is formed between the drilling flange and the independent screwed wellhead to provide a fluid seal between the drilling flange and the independent screwed wellhead even in the event of a fire on the wellhead;
inserting a drill string through an axial passageway of the drilling flange; and

rotating the drill string to drill down to the at least one hydrocarbon formation.

20. A drilling flange for an independent screwed wellhead, comprising a generally annular flange body having a top end that terminates in a top flange for supporting a blowout preventer, an axial passageway having a diameter at least as large as an inner diameter of the independent screwed wellhead, and a bottom end having an annular shoulder on an outer surface of a sidewall thereof that rotatably supports a lockdown nut for securing the drilling flange to a top of the independent screwed wellhead, the bottom end including an annular groove for receiving a metal ring gasket for providing a metal-to-metal seal between the drilling flange and the independent screwed wellhead.

21. A drilling flange and an independent screwed wellhead in combination, comprising:

a drilling flange comprising a generally annular flange body having a top end that terminates in a top flange for supporting a blowout preventer, an axial passageway having a diameter at least as large as an inner diameter of the independent screwed wellhead, and a bottom end having an annular shoulder on an outer surface of a sidewall thereof that rotatably supports a lockdown nut for securing the drilling flange to the independent screwed wellhead, the bottom end including a first annular groove for receiving an upper half of a metal ring gasket; and

an independent screwed wellhead comprising a top end to which the drilling flange is mounted, the top end including a second, complimentary annular groove for receiving a lower half of the metal ring gasket;

whereby when the drilling flange is mounted to the independent screwed wellhead and the lockdown nut is tightened, the metal flange gasket is compressed in the first and second annular grooves to provide a metal-to-metal fluid seal.

22.- The combination claimed in claim 21 wherein the top end of the independent screwed wellhead further comprises at least one radial groove for receiving an elastomeric O-ring for providing another fluid seal between the independent screwed wellhead and the drilling flange.

23. A drilling flange and an independent screwed wellhead, in combination, comprising:

a drilling flange comprising a generally annular flange body having a top end that terminates in a top flange for supporting a blowout preventer, an axial passageway having a diameter at least as large as an inner diameter of the independent screwed wellhead, and a bottom end having an annular shoulder on an outer surface of a sidewall thereof that rotatably supports a lockdown nut for securing the drilling flange to the independent screwed wellhead, the bottom end including a frusto-conical contact surface; and

an independent screwed wellhead comprising a top end to which the drilling flange is mounted, an inner surface of the top end including a contact surface complimentary with the frusto-conical contact surface of the drilling flange;

whereby when the drilling flange is mounted to the independent screwed wellhead and the lockdown nut is tightened, the frusto-conical contact surface is forced into sealing contact with the complimentary contact surface to provide a metal-to-metal fluid seal.

24. The combination claimed in claim 23 wherein the top end of the independent screwed wellhead further comprises at least one radial groove for receiving an elastomeric O-ring for providing another fluid seal between the independent screwed wellhead and the drilling flange.
25. An independent screwed wellhead, comprising a top end for mating engagement with a bottom end of a flange to be mounted thereto, the top end comprising an annular groove for receiving a metal flange gasket that is compressed between the independent screwed wellhead and the flange, to provide a high-pressure metal-to-metal seal when the flange is mounted thereto.
26. An independent screwed wellhead as claimed in claim 25 wherein the flange comprises a drilling flange having a bottom end with a peripheral annular shoulder for rotatably supporting a lockdown nut for

securing the drilling flange to the independent screwed wellhead.

27. An independent screwed wellhead as claimed in claim 25 further comprising a radial groove in an inner sidewall of the top end of the independent screwed wellhead, the radial groove receiving an elastomeric O-ring that cooperates with a sidewall of the flange to provide another high-pressure seal between the independent screwed wellhead and the flange.
28. An independent screwed wellhead, comprising a top end for mating engagement with a bottom end of a flange to be mounted thereto, the top end comprising a machined surface for mating engagement with a complementary frusto-conical surface of a flange mounted thereto, to provide a high-pressure metal-to-metal seal between the flange and the fluid seal.
29. The independent screwed wellhead as claimed in claim 28 wherein the machined surface and the complementary frusto-conical offset are each offset from an axial plane of the independent screwed wellhead by 4° - 10° .
30. The independent screwed wellhead as claimed in claim 28 further comprising a radial groove in an inner sidewall of the top end for receiving an elastomeric seal ring for providing another high-pressure seal between the independent screwed wellhead and the flange.